

What is claimed is:

1. An optical glass comprising, by means of weight percentages, more than 32 percent and not more than 45 percent P_2O_5 , more than 0.5 percent and not more than 6 percent Li_2O , more than 5 percent and not more than 22 percent Na_2O , 6-30 percent Nb_2O_5 , 0.5-10 percent B_2O_3 , 0-35 percent WO_3 , 0-14 percent K_2O , and 10-24 percent $Na_2O + K_2O$, and the total of all the above components is not less than 80 percent.
2. The optical glass of claim 1, wherein the glass comprises, by means of weight percentages, more than 32 percent and not more than 40 percent P_2O_5 , 1-4 percent Li_2O , 10-19 percent Na_2O , 10-28 percent Nb_2O_5 , 1-5 percent B_2O_3 , 0-8 percent K_2O , and 12-22 percent $Na_2O + K_2O$, and the total of all the above components is not less than 80 percent.
3. The optical glass of claim 2, wherein the glass comprises 12-17 percent Na_2O , 15-26 percent Nb_2O_5 , 0-4 percent K_2O , and 14-19 percent $Na_2O + K_2O$.
4. The optical glass of claim 1, wherein the glass further comprises, by means of weight percentages, 0-2 percent SiO_2 , 0-5 percent Al_2O_3 , not less than 0 percent but less than 8 percent TiO_2 , 0-15 percent ZnO , 0-12 percent BaO , 0-18 percent WO_3 , not less than 0 percent but less than 1 percent Sb_2O_3 , and 0-1 percent SnO_2 , and the total of all of the above components and the components listed in any one of claims 1 to 3 is not less than 95 percent.
5. The optical glass of claim 1, wherein the glass comprises, by means of weight percentages, 0-3 percent Al_2O_3 , 0-6 percent TiO_2 , and 0-9 percent ZnO , where the total of all of the above components and the components listed in any one of claims 1 to 4 is not less than 95 weight percent.

6. The optical glass of claim 4 or 5, wherein the glass comprises 0.1 percent SiO_2 .

7. The optical glass of claim 1, wherein the glass comprises not less than 0 percent but less than 0.5 percent SiO_2 , 0.5 percent TiO_2 , 0.5 percent ZnO , and the total of the above components and the components listed in any one of claims 1 to 6 is not less than 98 percent.

8. The optical glass of claim 1, wherein the glass further comprises 3-15 weight percent WO_3 .

9. An optical glass comprised phosphate glass which comprises, by means of weight percentages, more than 0.5 percent and but not more than 6 percent Li_2O , more than 5 percent but not more than 22 percent Na_2O , 0.14 percent K_2O , 10-24 percent $\text{Na}_2\text{O} + \text{K}_2\text{O}$, 6-30 percent Nb_2O_5 , and not more than 45 percent P_2O_5 , and exhibits a refractive index (nd) of 1.64-1.72, an Abbé number (vd) of 29-36, and a sag temperature (T_s) of not greater than 520°C.

10. An optical glass comprised of phosphate glass which comprises, by means of weight percentages, more than 0.5 percent but not more than 6 percent Li_2O , more than 5 percent but not more than 22 percent Na_2O , 0.14 percent K_2O , 10-24 percent $\text{Na}_2\text{O} + \text{K}_2\text{O}$, 6-30 percent Nb_2O_5 , 0-35 percent WO_3 , 0.5 percent Al_2O_3 , and not less than 0 percent but less than 8 percent TiO_2 , and exhibits a refractive index (nd) of 1.64-1.72, an Abbé number (vd) of 29-36, and an sag temperature (T_s) of not greater than 520°C.

11. The optical glass of claim 9 or 10 wherein the glass comprises more than 32 weight percent but not more than 45 weight percent P_2O_5 .

12. An optical glass comprising, by means of weight percentages, more than 32

percent but not more than 45 percent P_2O_5 , more than 0.5 percent but not more than 6 percent Li_2O , more than 5 percent but not more than 22 percent Na_2O , 6-30 percent Nb_2O_5 , 0.5-10 percent B_2O_3 , 0-35 percent WO_3 , 0-14 percent K_2O , 10-24 percent $Na_2O + K_2O$, 0-2 percent SiO_2 , 0-5 percent Al_2O_3 , not less than 0 percent but less than 8 percent TiO_2 , 0-15 percent ZnO , 0-12 percent BaO , not less than 0 percent but less than 1 percent Sb_2O_3 , and 0-1 percent SnO_2 , where the total of the contents of each of the above-listed components is not less than 95 percent, the refractive index (nd) is 1.64-1.72, the Abbé number (vd) is 29-36, and the sag temperature (T_s) is not more than 520°C.

13. An optical glass comprised of phosphate glass which comprises Li_2O , Na_2O , Nb_2O_5 , and B_2O_3 as essential components, and not more than 2 weight percent SiO_2 an optional component, with a refractive index (nd) of 1.64-1.72, an Abbé number (vd) of 29-36, a sag temperature (T_s) of not more than 520°C, and a liquidus temperature (LT) of not more than 900°C.

14. The optical glass of claim 13, wherein the glass further comprises, by means of weight percentages, more than 32 percent but not more than 45 percent P_2O_5 , more than 0.5 percent but not more than 6 percent Li_2O , more than 5 percent but not more than 22 percent Na_2O , 6-30 percent Nb_2O_5 , and 0.5-10 percent B_2O_3 .

15. The optical glass of claim 1, wherein the glass further comprises, by means of weight percentages, 0-5 percent MgO , 0-5 percent CaO , 0-5 percent SrO , 0-3 percent La_2O_3 , 0-3 percent Y_2O_3 , 0-3 percent Gd_2O_3 , 0-3 percent ZrO_2 , not less than 0 percent but less than 1 percent As_2O_3 , 0-3 percent Ta_2O_5 , 0-3 percent In_2O_3 , 0-3 percent TeO_2 , 0-3 percent Bi_2O_3 , and 0-1 percent GeO_2 , where the total of the above-listed components and the components described in any one of claims 1 to 14 is not less than 99 percent.

16. The optical glass of claim 9, wherein the glass further comprises, by means

of weight percentages, 0.5 percent MgO, 0.5 percent CaO, 0.5 percent SrO, 0.3 percent La₂O₃, 0.3 percent Y₂O₃, 0.3 percent Gd₂O₃, 0.3 percent ZrO₂, not less than 0 percent but less than 1 percent As₂O₃, 0.3 percent Ta₂O₅, 0.3 percent In₂O₃, 0.3 percent TeO₂, 0.3 percent Bi₂O₃, and 0.1 percent GeO₂, where the total of the above-listed components and the components described in any one of claims 1 to 14 is not less than 99 percent.

17. The optical glass of claim 10, wherein the glass further comprises, by means of weight percentages, 0.5 percent MgO, 0.5 percent CaO, 0.5 percent SrO, 0.3 percent La₂O₃, 0.3 percent Y₂O₃, 0.3 percent Gd₂O₃, 0.3 percent ZrO₂, not less than 0 percent but less than 1 percent As₂O₃, 0.3 percent Ta₂O₅, 0.3 percent In₂O₃, 0.3 percent TeO₂, 0.3 percent Bi₂O₃, and 0.1 percent GeO₂, where the total of the above-listed components and the components described in any one of claims 1 to 14 is not less than 99 percent.

18. The optical glass of claim 12, wherein the glass further comprises, by means of weight percentages, 0.5 percent MgO, 0.5 percent CaO, 0.5 percent SrO, 0.3 percent La₂O₃, 0.3 percent Y₂O₃, 0.3 percent Gd₂O₃, 0.3 percent ZrO₂, not less than 0 percent but less than 1 percent As₂O₃, 0.3 percent Ta₂O₅, 0.3 percent In₂O₃, 0.3 percent TeO₂, 0.3 percent Bi₂O₃, and 0.1 percent GeO₂, where the total of the above-listed components and the components described in any one of claims 1 to 14 is not less than 99 percent.

19. An optical article comprised of the optical glass according to claim 1.

20. An optical article comprised of the optical glass according to claim 9.

21. An optical article comprised of the optical glass according to claim 10.

22. An optical article comprised of the optical glass according to claim 12.

23. An optical glass for precision press-molding wherein the glass is one according to claim 1.

24. A glass preform obtained by preforming the optical glass of claim 23.

25. A glass optical article obtained by reheat press-molding the glass preform of claim 24.

26. An optical article obtained by press-molding the optical glass of claim 1.